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5-1-2016

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### Recommended Citation

Stonewall, Jacklin; Berta, Margaret; Nation, Jeanna; Gillette, Meghan; and Dorneich, Michael C., "Gathering requirements for the development of an online RAT tool" (2016). *CIRTL Reports*. 1.

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# Gathering requirements for the development of an online RAT tool

## **Abstract**

This work documents the requirements gathering process for the design of a Readiness Assurance Test (RAT) tool to be used in online Team Based Learning (TBL) classrooms. Gathering requirements is the first step in the User-Centered Design (UCD) process. After gathering requirements for the tool, a preliminary design would be created, implemented, and evaluated. The process would then start again with requirements gathering for the next design iteration.

Team Based Learning has been shown to provide positive learning outcomes in face to face classrooms. Because of these positive outcomes, there has been interest in using the technique in online environments. This study determines student and faculty attitudes toward TBL and RATs (in current face-to-face classrooms and potential online classrooms), challenges associated with the RATs (both in face to face and potential online environments), and features needed by both faculty and students in an online RAT tool. This investigation was composed of three parts: student surveys, faculty surveys, and faculty interviews.

## **Disciplines**

Educational Methods | Higher Education

# Gathering requirements for the development of an online RAT tool

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Research funded by the Center for the Integration of Research, Teaching, and Learning (CIRTL); Teaching as Research (TaR)

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## Background

*Team Based Learning.* TBL is a teaching pedagogy which focuses on active learning by peer groups with the instructor acting as an aid (Michaelsen & Sweet, 2011). TBL has been shown to increase learning efficiency and effectiveness by providing an interactive, collaborative classroom environment (Michaelsen & Sweet, 2011). An integral part of TBL is the Readiness Assurance Test or RAT. The RAT is composed of two parts: the Individual RAT and the Team RAT. The RATs take the form of short quizzes to assure that they have completed the pre-work necessary to participate fully in class exercises. Students prepare for the RATs outside of class. The individual RAT (iRAT) is taken individually while the team RAT (tRAT) is completed collaboratively as a team in class. As a key part of TBL, RATs are a requirement for the implementation of the technique in online classes, but also a challenge. While the RATs work well in face-to-face classrooms, (by generating productive conversation and learning among the team as they reach a consensus) it has been difficult to replicate this learning process with asynchronous, online courses. As online courses become more sought after, the positive outcomes of TBL become more desired in these environments.

*Online Learning Environments.* Online learning environments (OLEs) differ from face-to-face classrooms. In an OLE, creating a clear, simple, and consistent course is of greater importance than in traditional classes (Swan, 2003). Active learning, frequent and constructive feedback, and strong instructor guidance are further components of creating a successful online course environment (Swan, 2003). In addition to the design of the course, the availability of discussion among online students also creates a more positive learning environment. Structured and well-managed online discussion gives students the opportunity to reflect not only on their own learning and writing, but that of their peers as well (Garrison & Cleveland-Innes, 2005).

## Method

The study was constructed to gather information in three areas: attitudes toward online TBL and RATs, potential challenges in online TBL and RATs, and requirements for an online RAT tool. The work was composed of two parts: a 28-question online survey for students and a 15-question online survey for faculty. Faculty also provided in-person interviews which were constructed to gain a deeper understanding of the needs of faculty in terms of using TBL and RATs in an online class.

The study included 17 student participants. Each student participant was an undergraduate student from Iowa State University who had taken at least one TBL class. The study also included 11 faculty and staff participants. Each faculty and staff participant taught at Iowa State University and had experiencing teaching using TBL.

## Results and Discussion

The figure below (Figure 1) shows the attitudes which students and faculty have toward the use of TBL and RATs in online classes. General student attitudes toward TBL and RATs were positive – students enjoyed TBL classes and working with their teams. Students reported that RATs helped motivate them to come to class prepared, kept them accountable, and helped them learn more about the material. However, student opinions on the benefit of online TBL were neutral. Students worried about effective team communication in an online environment and suggested a variety of chat tools to mitigate this concern. Students also expressed concern for cheating and accountability and suggested tracking and timing features to keep classmates honest. Faculty expressed strong interest in using TBL online, but also thought it would be challenging due to the difficulty of conducting team RATs. Similar to students, faculty required team communication tools and participation statistics. Faculty were willing to use a tool outside of current learning management systems (i.e. BlackBoard), but preferred that the tool communicate with BlackBoard's grade book and be easy to learn. Challenges of TBL in online classrooms were similar for both groups with team dynamics and discussion being the main concerns.

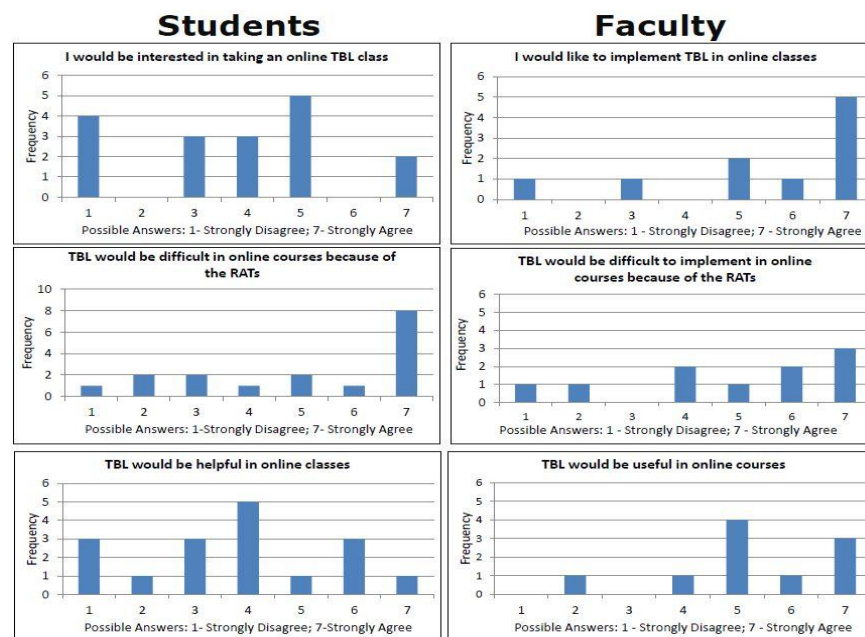


Figure 1. Student and faculty attitudes toward TBL and RATs in online classes

Specific requirements for the student group included: discussion function (text and video/audio chat), collaborative document editing tool, team member participation statistics, and timing features. Faculty required: team discussion, simultaneous reporting, whole-class discussion, individual student performance and participation statistics, appeals process, integration with current classroom management software, and ease of use.

## Conclusion

This work developed the requirements for the design of a RAT tool to be used in an online TBL classroom. The most important requirements for both students and faculty were robust discussion functions and participation tracking and statistics. Faculty expressed positive attitudes toward TBL in online classes and showed interest in implementing the technique in their classes. Students' opinions on TBL in online classes were generally neutral and they expressed concerns about the challenges associated with completing RATs online.

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